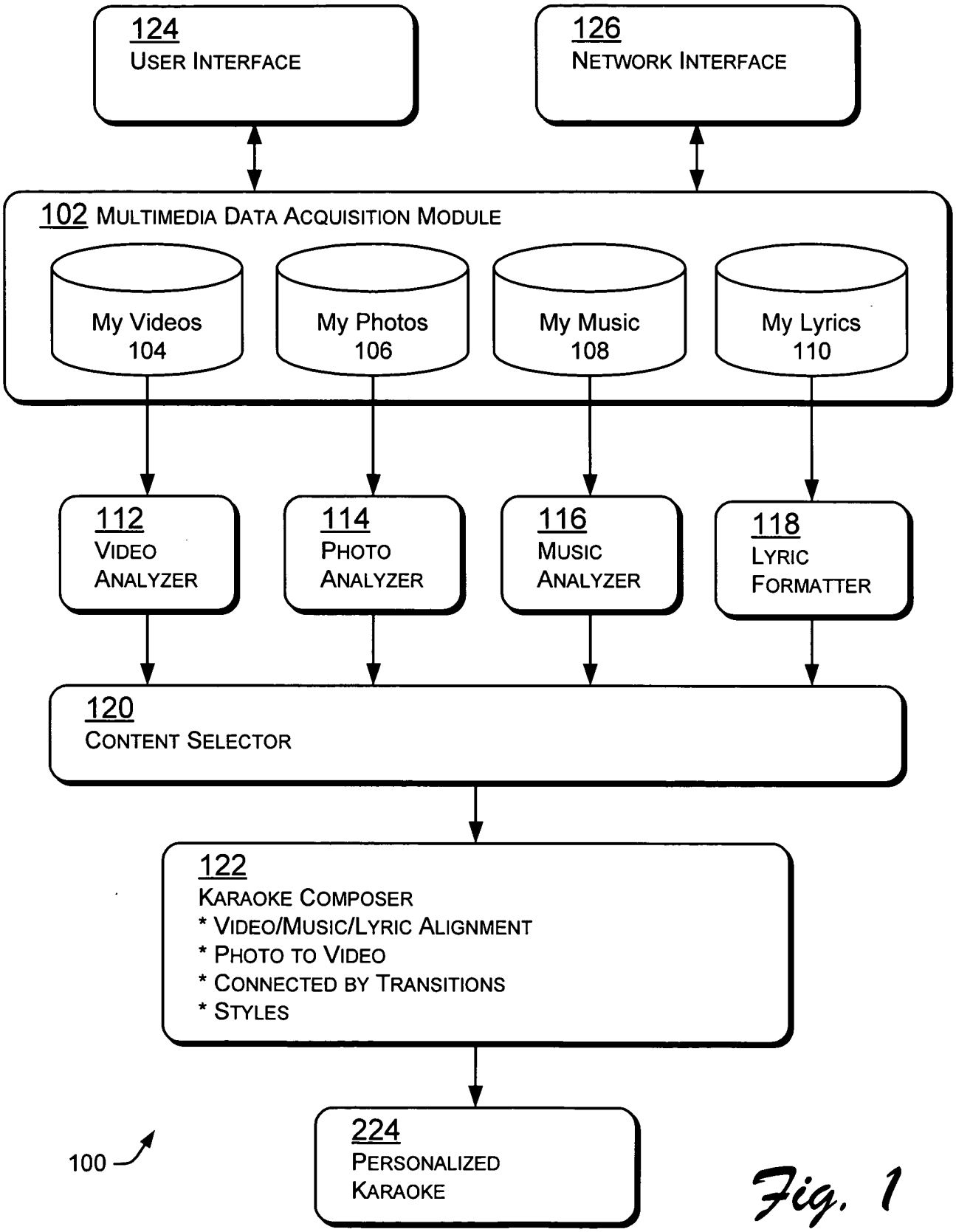

124
USER INTERFACE
126
NETWORK INTERFACE
102 MULTIMEDIA DATA ACQUISITION MODULE
My Videos
104
My Photos
106
My Music
108
My Lyrics
110
112
VIDEO
ANALYZER
114
PHOTO
ANALYZER
116
MUSIC
ANALYZER
118
LYRIC
FORMATTER
120
CONTENT SELECTOR
122
KARAOKE COMPOSER
* VIDEO/MUSIC/LYRIC ALIGNMENT
* PHOTO TO VIDEO
* CONNECTED BY TRANSITIONS
* STYLES
224
PERSONALIZED
KARAOKE
100

Fig. 1

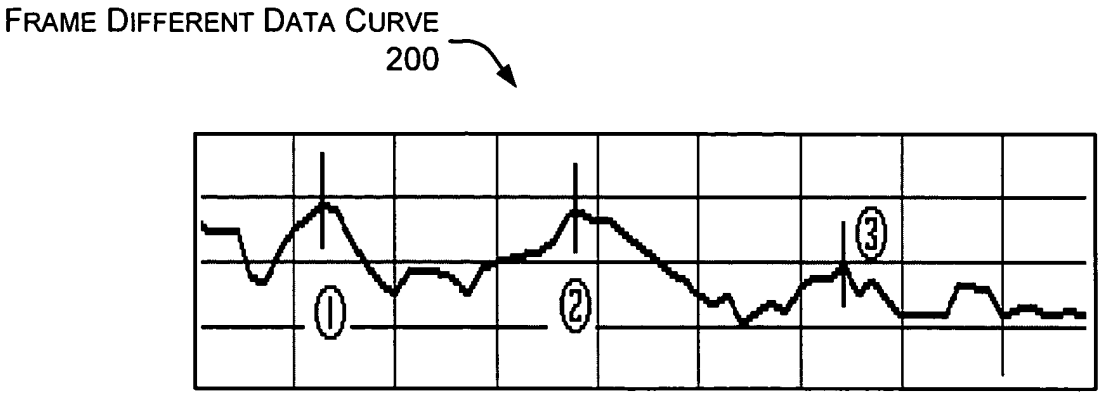

FRAME DIFFERENT DATA CURVE
200
1
2
3

Fig. 2

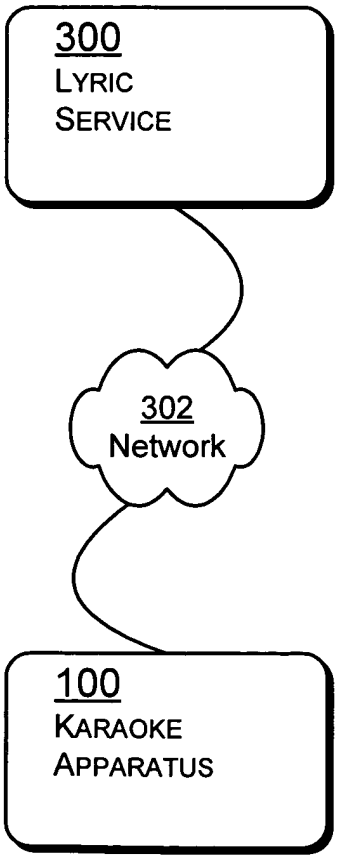

300
LYRIC
SERVICE
302
Network
100
KARAOKE
APPARATUS

Fig. 3

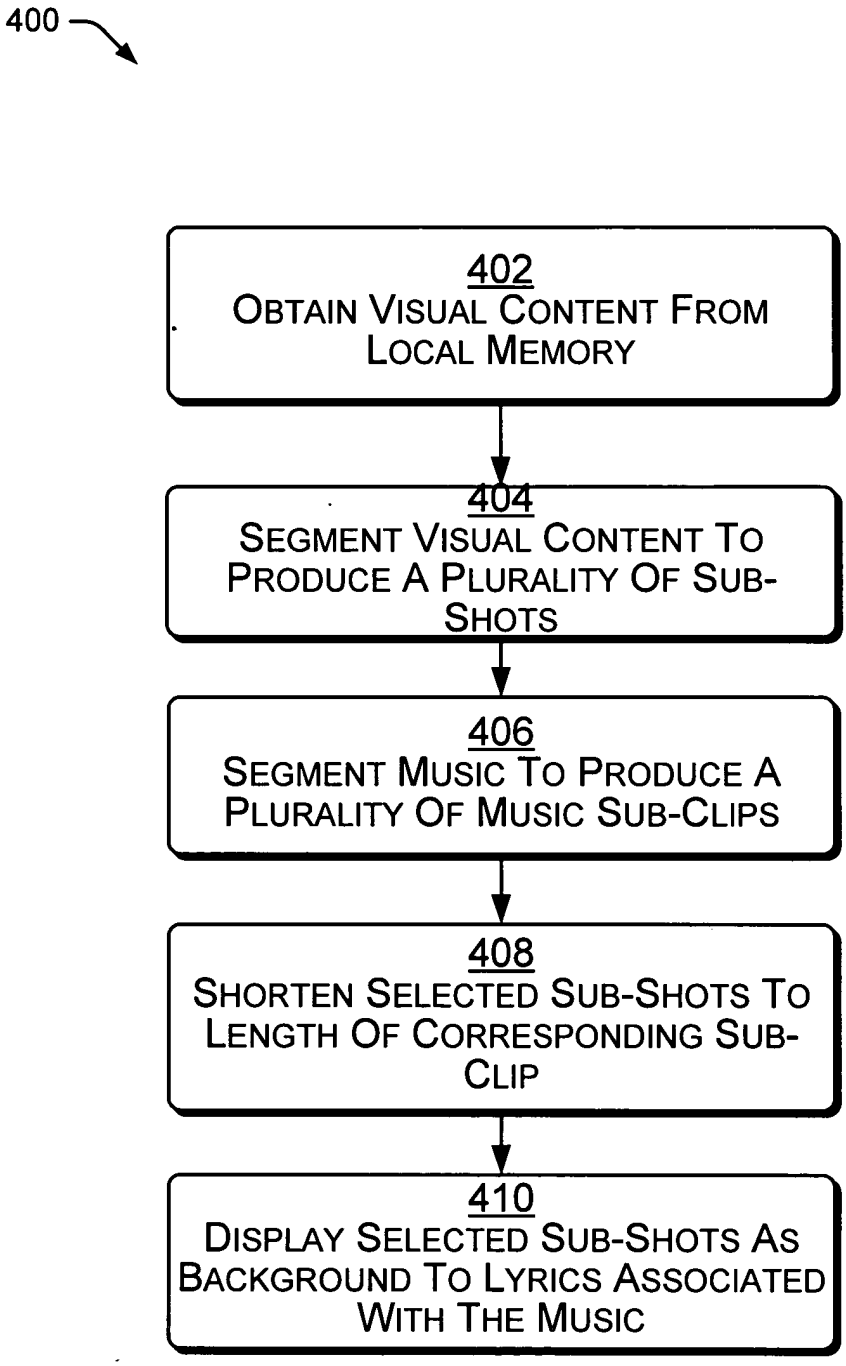

400
402
OBTAIN VISUAL CONTENT FROM LOCAL MEMORY
404
SEGMENT VISUAL CONTENT TO PRODUCE A PLURALITY OF SUB-SHOTS
406
SEGMENT MUSIC TO PRODUCE A PLURALITY OF MUSIC SUB-CLIPS
408
SHORTEN SELECTED SUB-SHOTS TO LENGTH OF CORRESPONDING SUB-CLIP
410
DISPLAY SELECTED SUB-SHOTS AS BACKGROUND TO LYRICS ASSOCIATED WITH THE MUSIC

Fig. 4

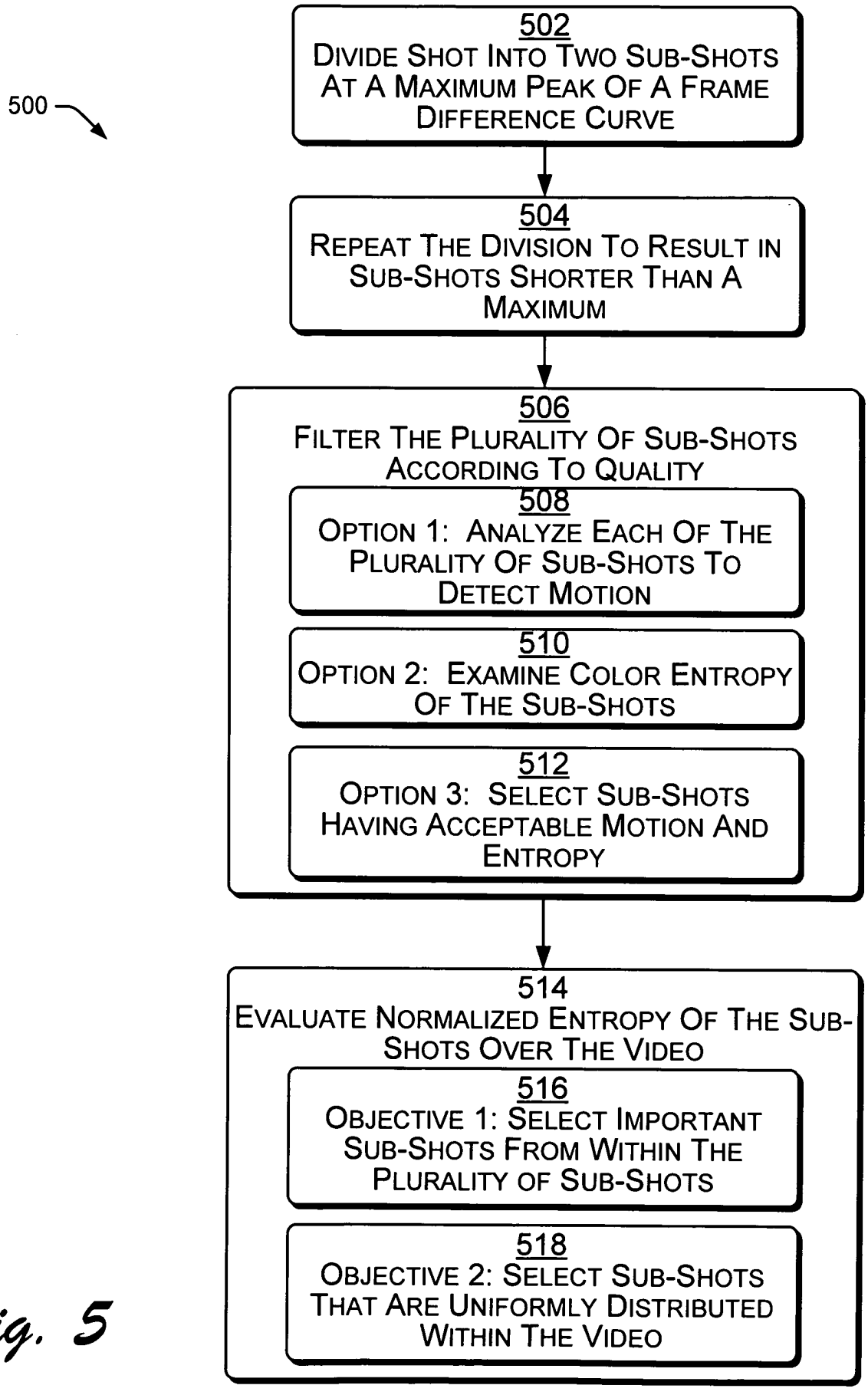
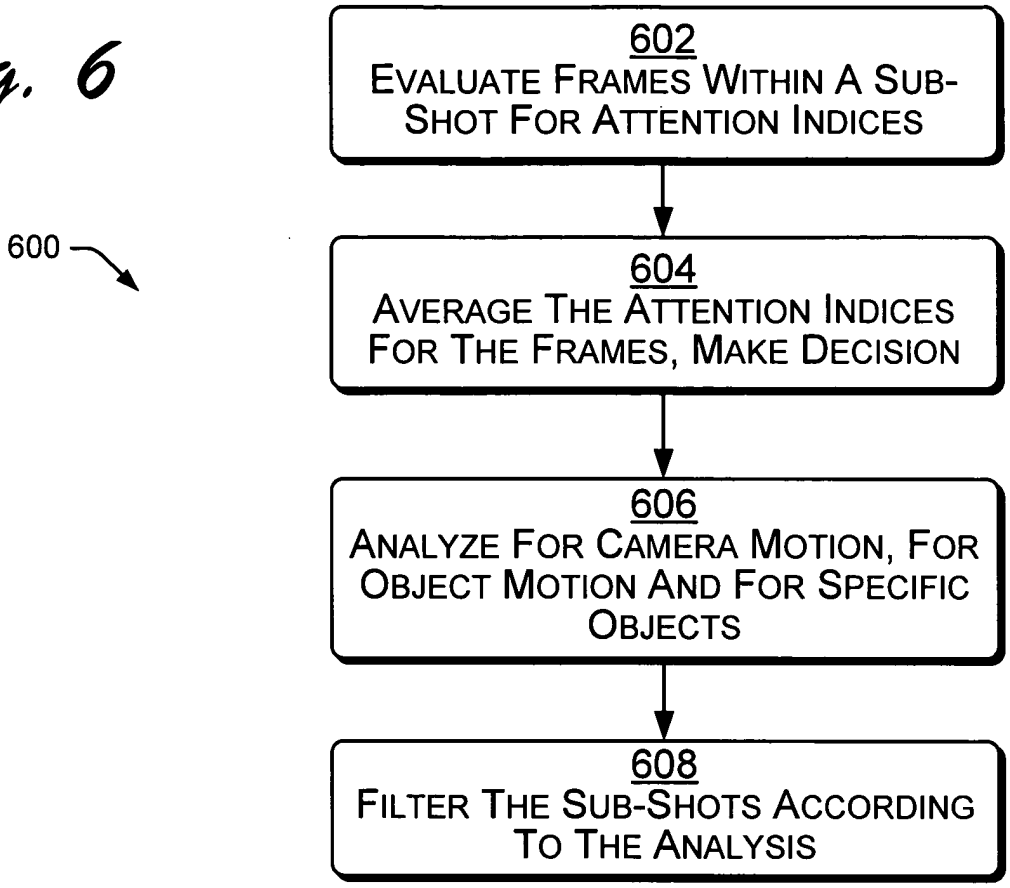

500
502
Divide Shot Into Two Sub-Shots At A Maximum Peak Of A Frame Difference Curve
504
Repeat The Division To Result In Sub-Shots Shorter Than A Maximum
506
Filter The Plurality Of Sub-Shots According To Quality
508
Option 1: Analyze Each Of The Plurality Of Sub-Shots To Detect Motion
510
Option 2: Examine Color Entropy Of The Sub-Shots
512
Option 3: Select Sub-Shots Having Acceptable Motion And Entropy
514
Evaluate Normalized Entropy Of The Sub-Shots Over The Video
516
Objective 1: Select Important Sub-Shots From Within The Plurality of Sub-Shots
518
Objective 2: Select Sub-Shots That Are Uniformly Distributed Within The Video

Fig. 5

Fig. 6


600
602
EVALUATE FRAMES WITHIN A SUB-SHOT FOR ATTENTION INDICES
604
AVERAGE THE ATTENTION INDICES FOR THE FRAMES, MAKE DECISION
606
ANALYZE FOR CAMERA MOTION, FOR OBJECT MOTION AND FOR SPECIFIC OBJECTS
608
FILTER THE SUB-SHOTS ACCORDING TO THE ANALYSIS

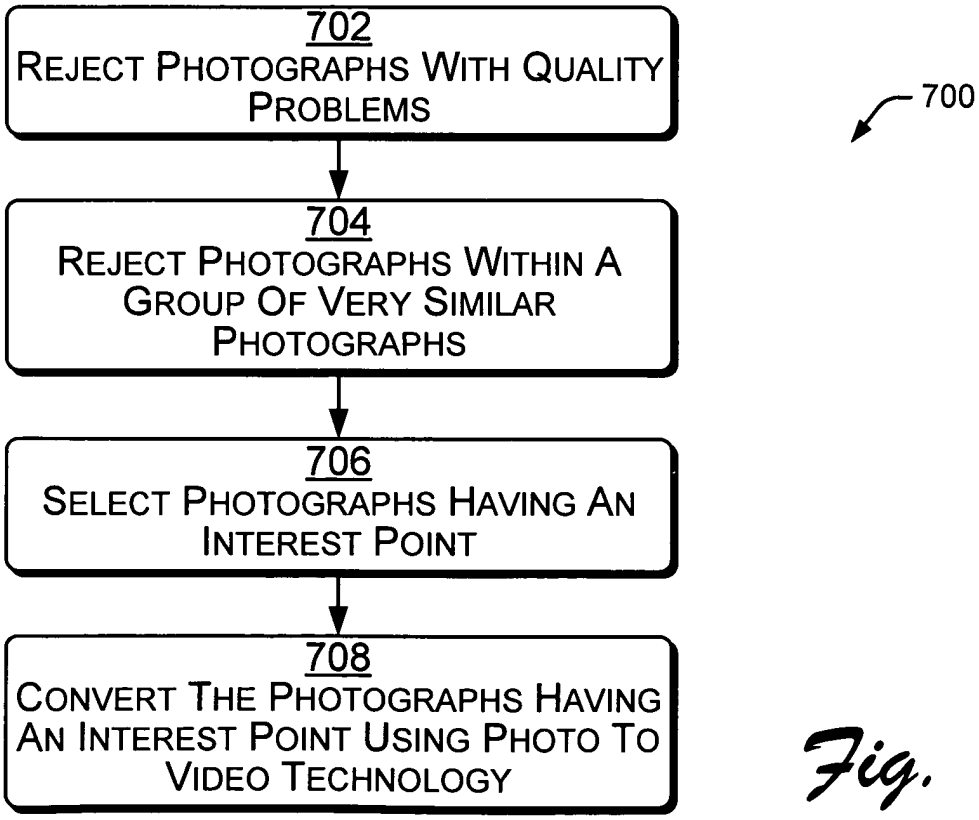

700
702
REJECT PHOTOGRAPHS WITH QUALITY PROBLEMS
704
REJECT PHOTOGRAPHS WITHIN A GROUP OF VERY SIMILAR PHOTOGRAPHS
706
SELECT PHOTOGRAPHS HAVING AN INTEREST POINT
708
CONVERT THE PHOTOGRAPHS HAVING AN INTEREST POINT USING PHOTO TO VIDEO TECHNOLOGY

Fig. 7

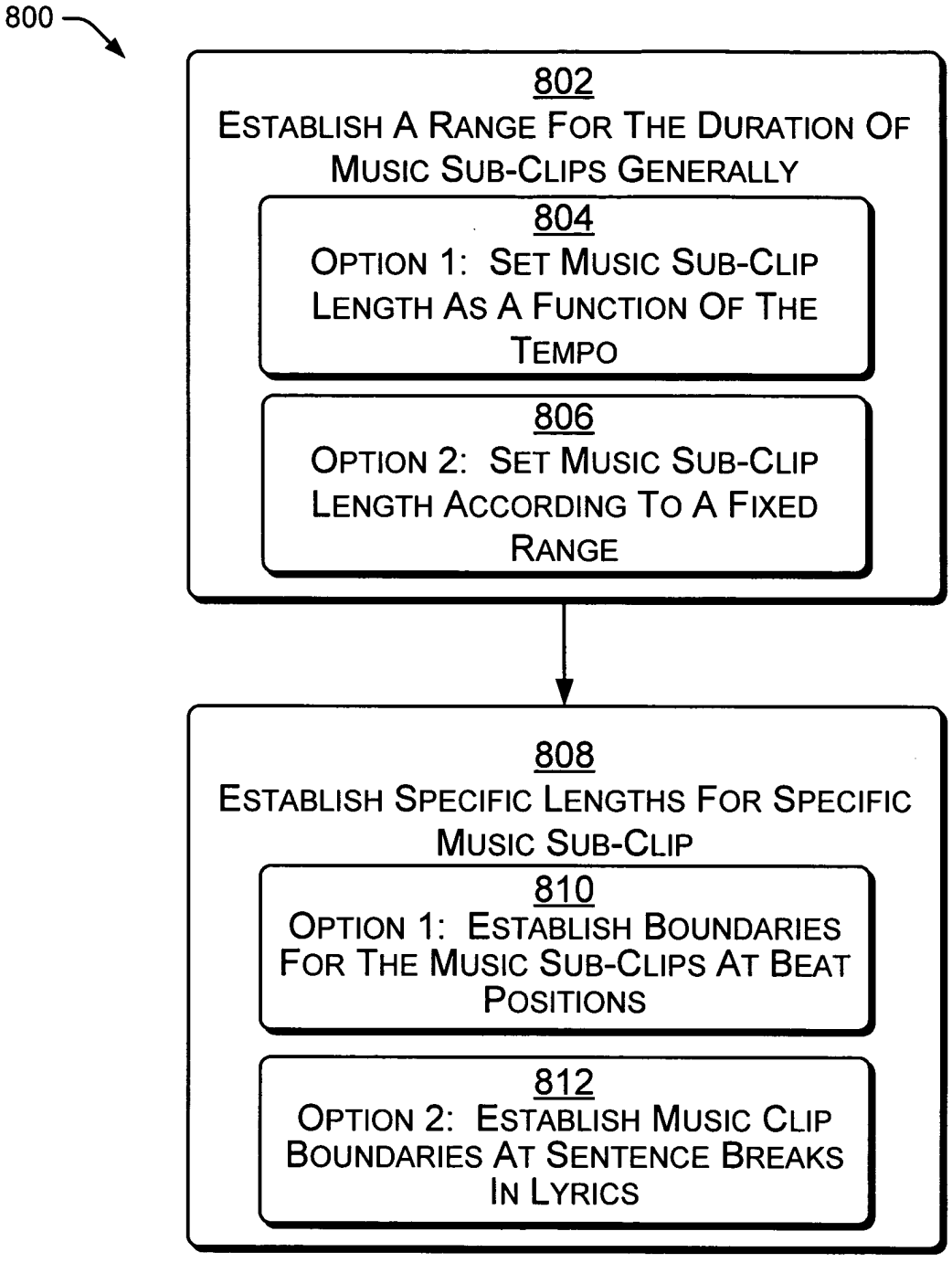

800
802
ESTABLISH A RANGE FOR THE DURATION OF MUSIC SUB-CLIPS GENERALLY
804
OPTION 1: SET MUSIC SUB-CLIP LENGTH AS A FUNCTION OF THE TEMPO
806
OPTION 2: SET MUSIC SUB-CLIP LENGTH ACCORDING TO A FIXED RANGE
808
ESTABLISH SPECIFIC LENGTHS FOR SPECIFIC MUSIC SUB-CLIP
810
OPTION 1: ESTABLISH BOUNDARIES FOR THE MUSIC SUB-CLIPS AT BEAT POSITIONS
812
OPTION 2: ESTABLISH MUSIC CLIP BOUNDARIES AT SENTENCE BREAKS IN LYRICS

Fig. 8

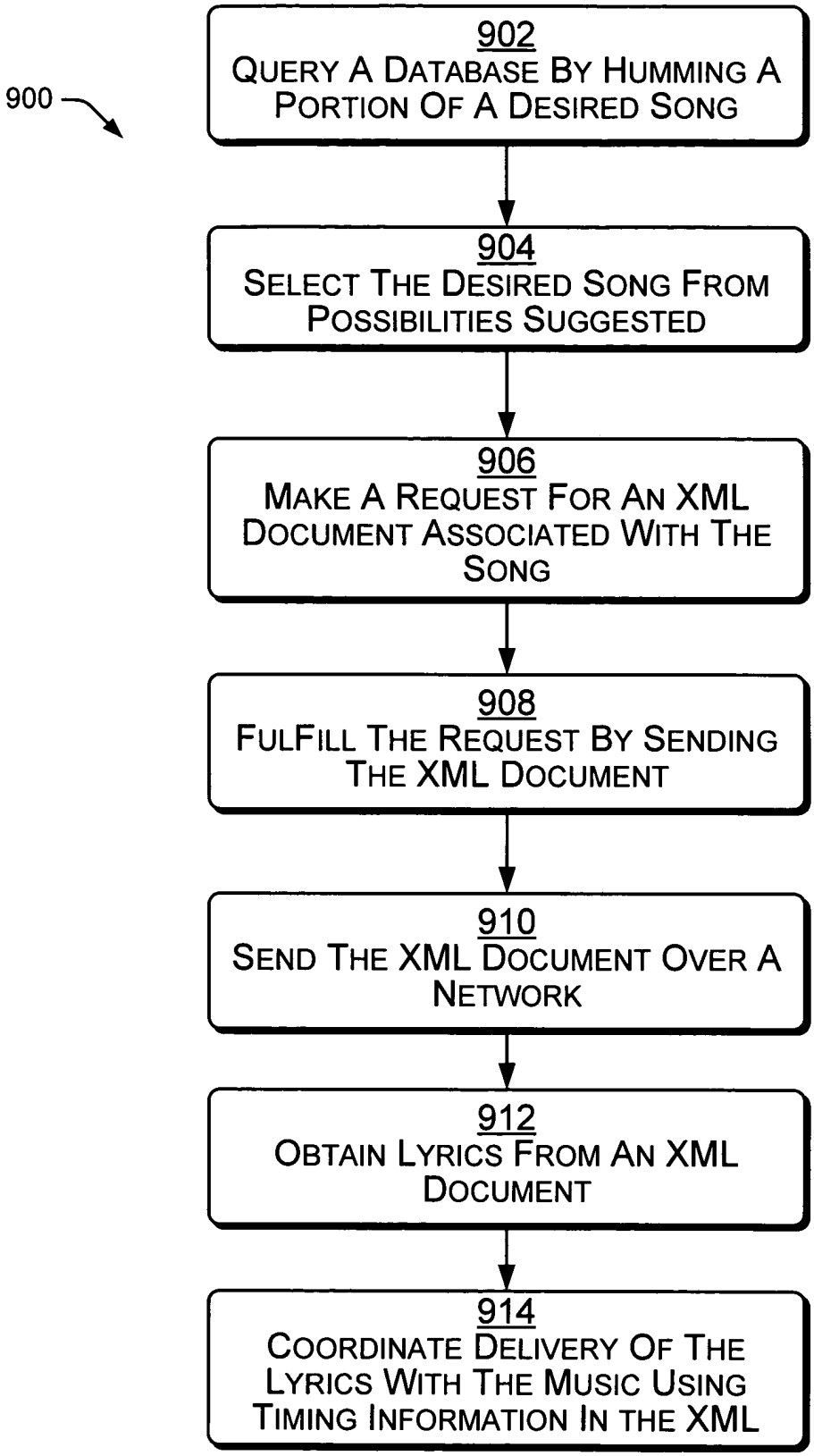

900
902
QUERY A DATABASE BY HUMMING A PORTION OF A DESIRED SONG
904
SELECT THE DESIRED SONG FROM POSSIBILITIES SUGGESTED
906
MAKE A REQUEST FOR AN XML DOCUMENT ASSOCIATED WITH THE SONG
908
FULFILL THE REQUEST BY SENDING THE XML DOCUMENT
910
SEND THE XML DOCUMENT OVER A NETWORK
912
OBTAIN LYRICS FROM AN XML DOCUMENT
914
COORDINATE DELIVERY OF THE LYRICS WITH THE MUSIC USING TIMING INFORMATION IN THE XML

Fig. 9

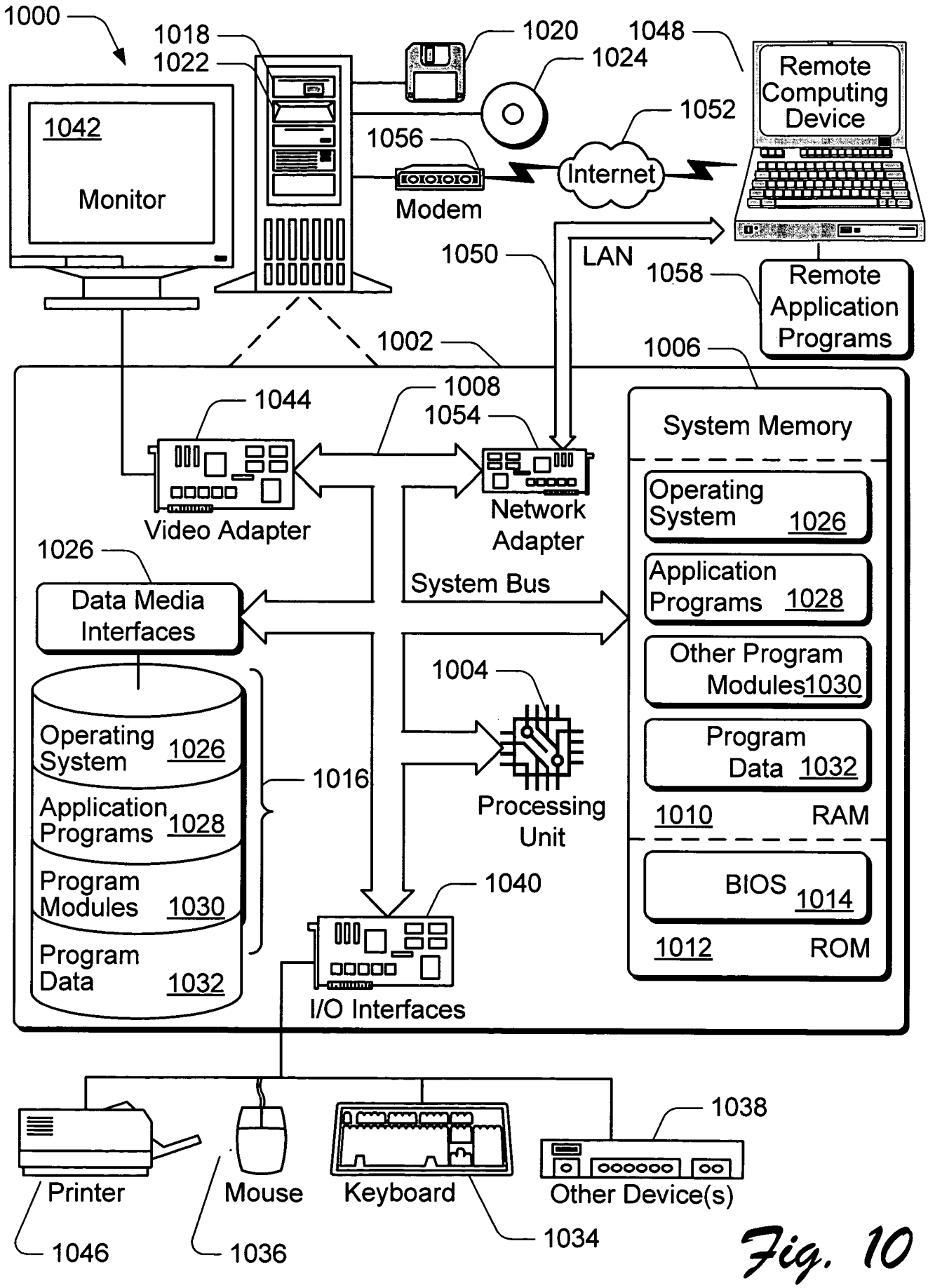

1000
1018
1022
1020
1024
1048
Remote Computing Device
1042
Monitor
1052
1056
Internet
Modem
1050
LAN
1058
Remote Application Programs
1002
1006
1044
1008
1054
System Memory
Operating System 1026
Application Programs 1028
Other Program Modules1030
Program Data 1032
1010
RAM
BIOS 1014
1012
ROM
Video Adapter
Network Adapter
1026
Data Media Interfaces
System Bus
1004
Processing Unit
Operating System 1026
Application Programs 1028
Program Modules 1030
Program Data 1032
1016
1040
I/O Interfaces
Printer
Mouse
Keyboard
1038
Other Device(s)
1046
1036
1034

Fig. 10